The Tennessee Advisory Commission on Intergovernmental Relations

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MEMORANDUM

TO: Commission Members

FROM: Cliff Lippard
Executive Director

DATE: 26 January 2017

SUBJECT: Broadband Internet Deployment, Availability, and Adoption in Tennessee—Final Report for Approval

The attached commission report is submitted for your approval. Staff has continued to refine the information and recommendations presented in the report to address questions and feedback from members at the December 2016 meeting.

As noted in the draft report, approximately 89% of Tennesseans live in census blocks where at least one provider reported offering wireline or fixed wireless service with a capacity of 25/3 according to data collected by the Federal Communications Commission (FCC) in December 2015. More than 93% live in census blocks where at least one provider reported offering wireline or fixed wireless service with a capacity of 10/1. We have clarified in the report that this represents the maximum extent of wireline and fixed wireless broadband coverage as of December 2015. The data do not say whether everyone in these census blocks has access to service at the reported capacities, nor do the data include coverage expansions that have occurred since. While only 40% of households located in census blocks where providers reported offering at least 25/3 broadband subscribed to the service according to the FCC's 2016 Broadband Progress Report, we have also clarified that it is possible that the state's adoption rate is higher than reported by the FCC because, again, the data do not say whether everyone in these blocks has access to service.

The Commission's research has found that there are already several government and private initiatives to address both broadband access and broadband adoption. Based on these existing resources, the report makes the following recommendation:

- ***Tennessee should focus its efforts on supporting and coordinating these existing initiatives and on addressing any remaining coverage and adoption gaps. Any government response should focus on working with the private sector—both for-profit and non-profit—to fill the gaps in the manner least costly to taxpayers without expanding the role of government.***

The report makes several supporting recommendations to encourage more Tennesseans to adopt service:

- Tennessee's local library system is an existing resource that is positioned to help residents improve their digital literacy skills and learn about the ways they can benefit from broadband. The Tennessee State Library and Archives (TSLA) has adopted technology services guidelines that call for all libraries serving at least 5,000 patrons to offer meeting space and devices to community organizations for digital literacy training. Libraries are also encouraged to provide digital literacy training several times a year depending on size, ranging for once per quarter for smaller libraries to twice per month for larger libraries. ***Increasing funding so that all libraries meet TSLA's guidelines would improve access to digital literacy resources throughout the state and could assist communities that want to implement programs for encouraging broadband adoption.*** Ensuring that all libraries meet TSLA's guidelines would cost approximately $144,640 per year, according to TSLA.
- Further, 18 libraries throughout the state are addressing the affordability gap in their communities by lending hotspot devices that allow patrons to access wireless broadband. Providers offer hotspot devices to libraries at no cost, while monthly broadband service costs approximately $32 per device—$384 per device annually. ***Expanding the hotspot lending program would encourage more individuals to use broadband by increasing their access to service they could not afford on their own.*** We clarified in the report that it would cost more than $1.6 million annually to deploy enough hotspots at libraries statewide so that there is one device for every 1,500 residents, which would be a reasonable ratio according to TSLA.
- As community anchor institutions, schools and libraries are vital resources that facilitate broadband use by making service available to students and community members who aren't able to afford it on their own. The federal E-Rate program provides subsidized broadband service to schools and libraries. The program's subsidies cover up to 90% of the cost of service. While every school and library in the state has internet access, not all have broadband quality service. ***The***

Department of Education and the Tennessee State Library and Archives should continue to work with schools and libraries to help them maximize the state's use of E-Rate funding to ensure that all schools and libraries have broadband. They should explore options to better educate them about the funds and the application process and to better assist them administratively in completing the applications.

- Broadband adoption programs typically offer some combination of digital literacy training, service discounts, and device subsidies. The Tech Goes Home program that began in Boston and has been implemented in Chattanooga and the Anytime Access for All and Connect Home initiatives in Nashville, have combined digital literacy resources with service discounts and device subsidies to maximize their effectiveness. Adoption programs that target specific populations such as the elderly and families with schoolchildren also tend to be more successful. ***The state, through the coordinated efforts of its existing agencies, including the Department of Economic and Community Development, the Department of Education, and the regional development districts, and its existing local assistance resources, including the Municipal Technical Advisory Service and the County Technical Assistance Service, should encourage and assist local governments in establishing targeted broadband adoption programs that combine training and financial assistance.*** The cost per participant in programs like those in Nashville and Chattanooga ranges from $145 per participant for both of Nashville's programs to a two-year average of $330 per participant in Chattanooga's Tech Goes Home program. Although not everyone who completes these programs will adopt broadband, 91% of participants in Chattanooga's program subscribe to home broadband six months after completing the program compared with only 64% before taking the program—Nashville does not collect before-and-after adoption data for its programs.

The report also makes several supporting recommendations to increase broadband availability in Tennessee:

- Reducing the costs of expanding networks by funding grants to providers is one option to help increase access to broadband throughout the state. The FCC is already offering grants totaling up to $210 million over seven years through the Connect America Fund phase II (CAF II) to three providers in Tennessee. Providers must use these grants to offer broadband of at least ten megabits per second download and one megabit per second upload to more than 93,000 homes and businesses. We have clarified in the report that the number of housing units in Tennessee census blocks where no provider reported offering

10/1 service as of December 2015 that won't receive coverage through CAF II will likely total between 114,000 and 160,000 units depending on the extent to which providers use funding in eligible census blocks where some 10/1 service is already reported. Several states have their own grant programs for expanding broadband coverage. The most successful of these, including Maine and Minnesota, use a competitive bidding process to choose projects to ensure that state funds maximize coverage in unserved and underserved areas. Tennessee Code Annotated, Section 7-59-315, already creates a broadband deployment fund for Tennessee, but no funds have ever been appropriated to it. ***Tennessee could use the broadband deployment fund to provide competitive grants to unserved or underserved areas not already being targeted by Connect America Fund grants.*** Expanding coverage of 10/1 to the remaining 114,000 to 160,000 housing units in census blocks where no provider reported offering at least 10/1 as of December 2015 that don't receive coverage through CAF II could cost between $125 million and $799 million. But some of these housing units may be served as a result of subsequent rounds of Connect America Fund grants, leaving a smaller gap for any state grant program to fill. We have clarified in the report that if the FCC finalizes the CAF alternative model and the CAF auction without any modifications, 23,000 housing units that are both located in unserved census blocks and won't be covered as a result of CAF II could receive service. Further, providers will be required to expand coverage to approximately 5,000 additional locations through the CAF broadband loop support program. After accounting for these programs, expanding coverage to the 86,000 to 132,000 housing units located in census blocks that still remain unserved could cost between $95 million and $661 million. We have also added a recommendation that ***Tennessee could use the broadband deployment fund to provide funding for programs and resources that encourage broadband adoption, though an additional authorization would likely be necessary to use the fund for these purposes.***

Cost to Expand Coverage to Housing Units in Unserved Census Blocks after CAF II, Alternative Model, Auction, and Broadband Loop Support, Assuming All Units in CAF II Eligible Blocks Are Served

Census Blocks where No Provider Reported 10/1 as of December 2015	Number of Housing Units	Cost to Expand Coverage		
		Range of ECD Cost Estimates		Southern Tier Wireless Cost Estimate for Fiber-to-the-Home ($5,000 per location)
		Fixed Wireless Min. Est. ($1,100 per location)	Fiber-to-the-Home Max. Est. ($3,840 per location)	
Before Accounting for CAF	193,881	$ 213,269,100	$ 744,503,040	$ 969,405,000
After CAF II (assumes all units in eligible blocks are served)	113,830	$ 125,213,000	$ 437,107,200	$ 569,150,000
After CAF Alternative Model	99,137	$ 109,050,700	$ 380,686,080	$ 495,685,000
After CAF Auction	91,088	$ 100,196,800	$ 349,777,920	$ 455,440,000
After CAF BLS Build-Out Requirements	86,064	$ 94,670,400	$ 330,485,760	$ 430,320,000

Cost to Expand Coverage to Housing Units in Unserved Census Blocks after CAF II, Alternative Model, Auction, and Broadband Loop Support, Assuming 46,041 Units in CAF II Eligible Blocks Remain Unserved

Census Blocks where No Provider Reported 10/1 as of December 2015	Number of Housing Units	Cost to Expand Coverage		
		Range of ECD Cost Estimates		Southern Tier Wireless Cost Estimate for Fiber-to-the-Home ($5,000 per location)
		Fixed Wireless Min. Est. ($1,100 per location)	Fiber-to-the-Home Max. Est. ($3,840 per location)	
Before Accounting for CAF	193,881	$ 213,269,100	$ 744,503,040	$ 969,405,000
After CAF II (assumes 46,041 units in eligible blocks remain unserved)	159,871	$ 175,858,100	$ 613,904,640	$ 799,355,000
After CAF Alternative Model	145,178	$ 159,695,800	$ 557,483,520	$ 725,890,000
After CAF Auction	137,129	$ 150,841,900	$ 526,575,360	$ 685,645,000
After CAF BLS Build-Out Requirements	132,105	$ 145,315,500	$ 507,283,200	$ 660,525,000

- Eliminating Tennessee's sales tax on equipment purchases could lower construction costs and thus encourage providers to build out their networks, and providers that are legacy telephone companies would benefit from having their telecommunications property assessed at the commercial rates for property tax purposes like legacy cable television companies rather than the higher utility rates. But eliminating the sales tax on broadband equipment would reduce state revenue by approximately $45.5 million per year and local revenue by approximately $16.3 million per year according to the Tennessee Department of Revenue, and assessing legacy telephone companies at lower rates for property tax purposes would cost local governments more than $16 million per year according to the Tennessee Comptroller of the Treasury. Moreover, neither approach is targeted to increase broadband investment in unserved and underserved areas. Instead, ***Tennessee could offer credits against franchise and excise taxes for broadband infrastructure investments, and target improvements to unserved and underserved areas by giving larger credits for investments in those unserved and underserved areas.*** Mississippi has a similar tax credit against franchise and excise taxes for broadband infrastructure investment that provides larger credits for investments in regions of the state that have lower levels of economic development. ***As is done with other tax credit programs such as the low-income housing tax credit, the state could cap the amount of credits available statewide per year and use competitive application processes to award credits.***
- Local governments already have several options for expanding broadband coverage in their jurisdictions by reducing regulatory burdens on providers seeking to expand their networks. Access to rights of way is governed by local permitting processes that can delay projects and increase costs, and zoning regulations effectively prevent wireless infrastructure from being built in certain communities. Controlling access to rights of way and regulating land use through zoning are vital local government functions, but some communities may find they can attract private investment to expand coverage by streamlining local regulatory processes. ***To assist communities that want to streamline local regulations, Tennessee could, like Indiana and Wisconsin, designate communities that adopt a checklist of permitting and zoning procedures as "broadband ready communities" to signal providers that they have removed regulatory barriers to broadband investment.***
- Municipalities with electric systems are authorized to provide broadband within their electric service areas by Tennessee Code Annotated, Section 7-52-601 et seq., and ten currently do so. Senate Bill 1134 by Senator Janice Bowling and House

Bill 1303 by Representative Kevin Brooks in the 109th General Assembly would have removed the territorial restriction on municipal broadband providers. But municipalities that build broadband infrastructure outside of their electric service areas and taxing jurisdictions put electric ratepayers and municipal taxpayers at risk in the event that they are unable to earn enough revenue from subscribers to make debt payments on bonds issued to expand their systems. Moreover, Morristown Utilities, which is one of two systems allowed to provide broadband outside its electric service area under state law (the other system, Covington, has since sold its network), has not chosen to expand service beyond a few communities because of the cost of doing so. Electric cooperatives—which are not currently authorized to provide broadband under Tennessee law—have helped expand broadband access in rural areas in other states by building their own networks and serving as retail internet service providers. Although existing telephone cooperatives are allowed to provide broadband in Tennessee and do in many rural areas, their service territories do not extend as far as those of the state's electric cooperatives. We have clarified in the report that ***Tennessee could simply authorize electric cooperatives to provide retail broadband service in their electric service areas, like the state's municipal electric systems, so long as electric ratepayer revenue is not used to subsidize the cost of service. Electric cooperatives would have flexibility either to build their own infrastructure, employ their own staff, and operate their own networks for providing broadband or to contract with existing providers—including for-profit providers, telephone cooperatives, and municipal electric systems—for some or all of these services. To the extent that electric cooperatives contract with municipal electric systems, however, the municipal electric systems would not be authorized to issue bonds backed by their ratepayers or municipal taxpayers to construct networks for providing broadband outside their electric service areas.***

- We have also clarified that ***an additional option would be to allow the state's electric cooperatives to enter more formal partnerships, rather than simply contracting for services, with existing providers—including for-profit providers, telephone cooperatives, and municipal electric systems—to provide broadband in the electric cooperatives' service areas. The state need not prescribe a specific framework for these partnerships and instead could allow electric cooperatives and any private sector partners flexibility to structure partnerships to the advantage of all parties involved to the extent that the electric cooperatives' electric ratepayers are protected from subsidizing the cost of broadband service. Again, however, additional restrictions would be placed on municipal electric***

systems in these partnerships. Municipal electric systems would be forbidden from issuing bonds backed by their ratepayers or municipal taxpayers to construct networks for providing broadband outside their electric service areas, but they could use their existing staff and facilities to help operate the network. Tennessee Code Annotated, Section 7-59-316, already authorizes local governments, municipal utilities, and cooperatives, including electric cooperatives, to form joint ventures with existing providers to expand coverage but only within unserved areas that have been developed for residential use for five years, are outside of an existing cable franchise area, and which no other provider intends to serve. No one has set up a joint venture under this law according to TRA.

The report makes additional recommendations related to coordination and planning:

- Local planning and coordination with and among existing state agencies will be essential for increasing both adoption and access in Tennessee. Several states have created separate broadband offices to coordinate access and adoption strategies. While this approach can enable better coordination, it can create duplication, add complexity to decision making, and add to the cost of governing. Fortunately, this type of strategic coordination can be accomplished without having to create any new state agencies or offices. ***Tennessee could coordinate its broadband efforts using a standing working group made up of state and local officials, representatives of broadband providers, and representatives of the many not-profit organizations working to increase internet connectivity.*** An example of such a work group can be found with the state's Basic Education Program Review Committee, which meets periodically to help the administration and legislature set education funding priorities.
- ***The state could also include broadband as part of its annual infrastructure needs survey.*** By reporting broadband as a separate type within the transportation and other utilities category, the state can better calculate what the cost of meeting its broadband infrastructure needs are for the next five years.

Maximizing broadband's benefits to individuals and communities in Tennessee requires both encouraging adoption throughout the state and working with providers to increase availability in unserved and underserved areas. The cost per location of expanding broadband coverage in Tennessee could range from $1,100 per location for fixed wireless, according to the report accompanying ECD's broadband survey, to at least $5,000 per location for fiber-to-the-home, according to industry representatives. As noted above, the cost per participant of broadband adoption programs like those in

Nashville and Chattanooga ranges from $145 per participant for both of Nashville's programs to a two-year average of $330 per participant in Chattanooga's Tech Goes Home program.

We have clarified that simply expanding coverage to new locations does not guarantee that those who live or work there will adopt newly available broadband service and that not all those who complete broadband adoption programs ultimately adopt service. Cost per new subscriber is a better measure of how much it will cost to increase the number of Tennesseans who use broadband. Based on rates of broadband adoption reported by the FCC, the cost per new subscriber when simply expanding broadband coverage ranges from $2,391 to $10,870 per new subscriber for service of at least 10/1 and from $2,750 to $12,500 per new subscriber for service of at least 25/3. Based on Chattanooga's participant data, cost estimates per new subscriber for similar broadband adoption programs range from $193 per new subscriber for Nashville's Anytime Access for All program to $1,222 per new subscriber for Chattanooga's Tech Goes Home program. Estimates for these adoption programs vary widely in part because Chattanooga's program is open to individuals who already have home broadband while Nashville's Anytime Access for All program is not.

Cost to Increase Broadband Adoption: Expanding Coverage Alone Compared with Local Programs Targeted to Specific Populations

Cost	Expanding Broadband Coverage Alone		Local Programs for Encouraging Broadband Adoption that Target Specific Populations
	10/1 service	25/3 service	
Per New Location or Participant	$ 5,000*	$ 5,000**	$ 330***
Per New Subscriber	$ 10,870*	$ 12,500**	$ 1,222***
To Increase Broadband Adoption by 1% of Households Statewide	$ 272,234,348*	$ 313,069,500**	$ 30,611,240***

* Based on maximum cost per new location for fiber-to-the-home service using an estimate of $5,000 per location and 46% broadband adoption rate for those with access to 10/1 service in Tennessee reported in FCC's 2015 Broadband Progress Report.

** Based on maximum cost per new location for fiber-to-the-home service using an estimate of $5,000 per location and 40% broadband adoption rate for those with access to 25/3 service in Tennessee reported in FCC's 2016 Broadband Progress Report.

*** Based on two-year average cost per participant of Chattanooga's Tech Goes Home Program of $330 per participant and data from Chattanooga's program showing that 91% of participants subscribe to home broadband six months after completing the program compared with only 64% before taking the program.